Oregon
Kate Brown, Governor

Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
(503) 986-0900
Fax (503) 986-0904

O-15

February 8, 2017

Dan Schleigh, Manager, B Bar K Cascade Ranch
PO Box 558
Eagle Point, OR 97524

Re: 2016 Inspections of B Bar K Cascade Ranch Dams: Woodrat Knob (W-43); Lake Creek (L-24); Osborne (O-15) Bradshaw 1 and 2 (B-24, B-83), Frog Pond (F-30), Harrison (H-47)

The high hazard dams were inspected on June 7, 2016. I performed the inspections with Water Resources Engineer, Lyndsey Croghan and District 13 Watermaster, Travis Kelly. On November 3, 2016, Shavon Haynes, Acting Watermaster along with Tony Janicek, Dam Safety Coordinator and Benjamin Thorpe, Assistant Watermaster, inspected the other four dams that are not high hazard.

Summary: There is one major safety issue at all three high hazard dams and at three of the significant hazard dams (Bradshaw 1, Harrison, and Frog Pond). The issue is the near complete deterioration of the low level conduits at the dams. These dams had corrugated metal culverts installed in or about 1960, and these pipes are not long lasting. Regular maintenance of vegetation and debris has been very good, and you have worked with us on an emergency action plan (EAP) for the three high hazard dams. I have attached a working draft EAP for these three dams for your use and review (needs the equipment rentals and pumps you might use, plus a review by Jackson County.

Results of Inspection – Lake Creek L-24

Spillway control section with reservoir in background

The reservoir level was 9.2 feet below the dam crest when inspected. Minimum freeboard was 4.2 feet. Based on measurements and analysis, the spillway capacity appears sufficient to pass an extreme flood. The reservoir was clean.

Low level conduit is deteriorated

The corrugated metal culvert that serves as the low level conduit through this dam continues to deteriorate slowly. The holes are slightly larger, and there is also a cut in the pipe from we believe an engineers' attempt to evaluate the conduit with a remote camera. If the valve is completely open, it is very likely to leak significantly from these locations, and cause erosion of the embankment and native materials in this general location.

Outlet structure disconnected

The outlet works structure is heavily overgrown, and generally disconnected from the outlet pipe. The ground in this area is always wet and poorly drained, as evidenced by the

foxtail plants that are growing all around it. The trees (red alders) are also causing damage to the outlet structure.

Excellent vegetation cover, some seepage

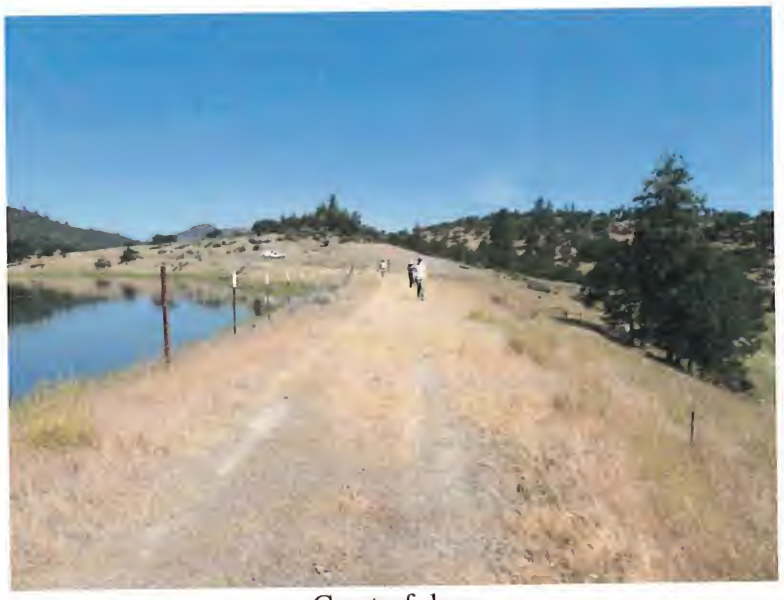
Both the upstream and downstream faces have a well maintained cover of grass, with very little woody vegetation. The only sign of seepage was in a few areas around the toe, with no observed leakage through the dam. We saw no sign of significant settlement or other indications of embankment instability.

Woodrat Knob W-43

Reservoir with dam in background

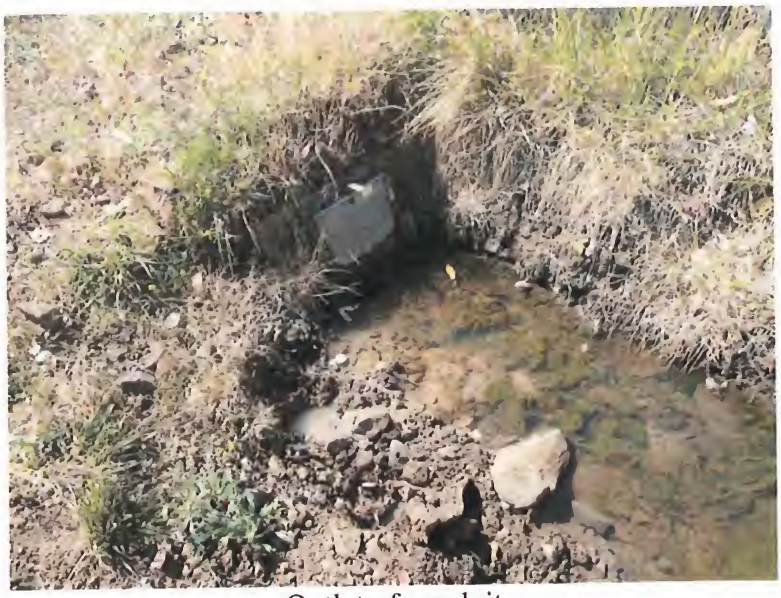
The reservoir level was 9.5 feet below the dam crest when inspected. Minimum freeboard was 6.3 feet, which is excellent. The reservoir was clean, with no logs or debris near the

dam. Both the up and downstream faces have a well maintained grass cover. The access and security at the dam are both good.



Crest of dam

The crest of the dam shows no sign of instability. There is no sign of reactivation of movement that caused a near failure of this dam in 1961. However, we have no information on water pressures inside the dam, as the piezometers (one shown on the downstream face in the photo above) have long been out of service.



Outlet of conduit

This dam has no low level outlet, probably because of the aforementioned near failure. This 18 inch culvert was placed at mid-elevation after that near failure. The culvert has deteriorated badly, and has reached the point where action is necessary to prevent this from becoming an unsafe condition. This culvert should be inspected if possible and either replaced, or if safe, relined.

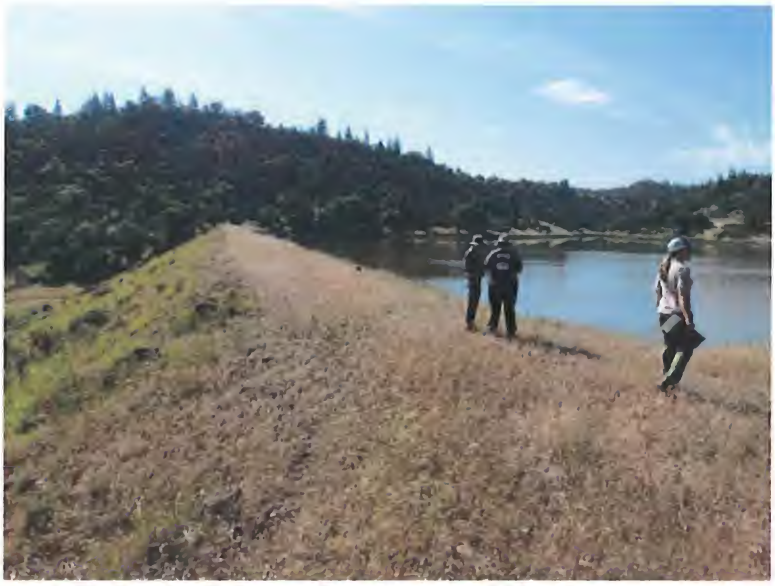
Seepage from failed drains

The seepage is caused by blockages and failure of the culverts installed in the early 60's to stabilize the dam after the major landslide. New drain pipes are necessary to ensure the stability of the berm and its ability to keep the dam stable. These drains are believed critical, as they reduce water pressures within the dam. Excess water pressure from water seeping through the dam likely caused the large failure in 1961.

New spillway

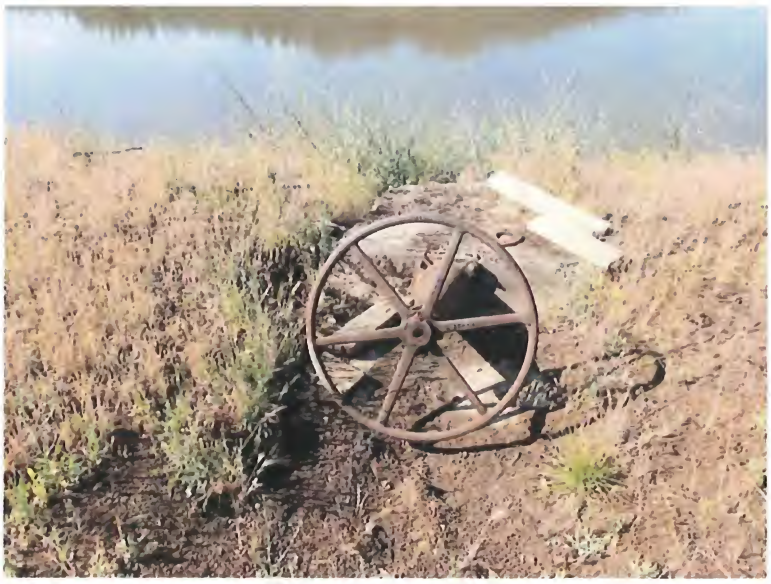
The new spillway had flow for the first time in the winter and early spring of 2016. The spillway handled these flows with no erosion at all. This structure has greatly improved the safety of Woodrat Knob dam, at least in eliminating the potential of an overtopping failure due to a flood.

Osborne (O-15)



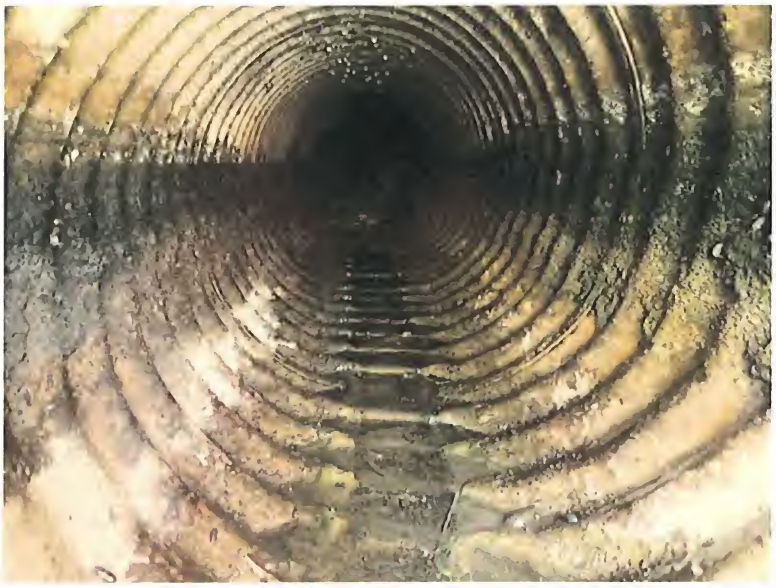
Reservoir and crest of dam

The reservoir level was 10.2 feet below the dam crest when inspected. Minimum freeboard was 4.5 feet, which is adequate. There is a little more woody vegetation on Osborne dam than on the other two dams inspected during this trip. The crest and embankment appear stable.



Valve was cycled

The control was operated for the first time in the last 5 years. It is nearly past its useful life. You will need an alternative that will be essential for draining water from the dam, both for maintenance, and in the event of an emergency. It may also be possible to construct a new outlet that is more conducive to your irrigation operations.



Inside of conduit

The inside of the outlet culvert is corroded, but we did not observe holes in the structure yet. This pipe will continue to deteriorate, and will become unsafe at some point in the not too distant future. On a positive note, you were able to operate the valve this year, and determine that both the valve and conduit are operational right now.

Brush regrowth around outlet

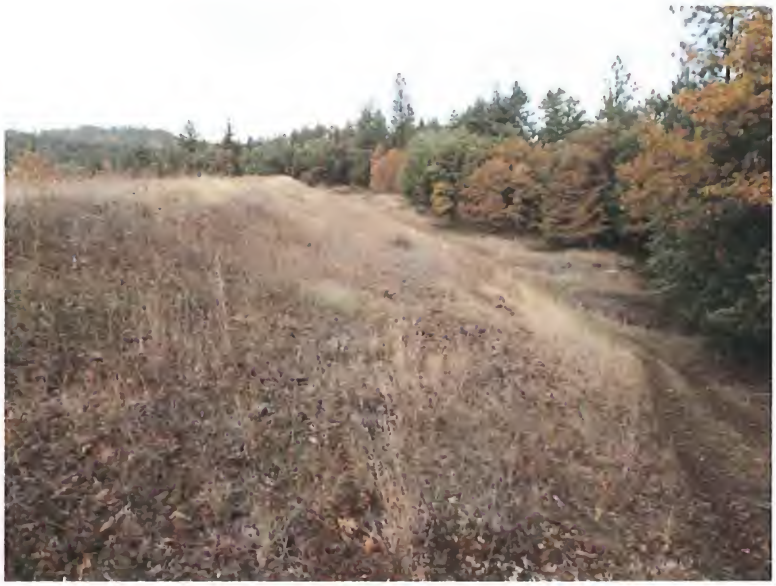
There is brush at the toe of the dam and there is seepage. The seepage is not collected, so it is not possible to determine if the rate of seepage is changing. The rest of dam has mostly grass cover and nothing restricts inspection. We observed no signs of instability on this dam, at this time.

Other Dams (not rated high hazard)

Bradshaw 1 (B-24)

Deteriorated outlet conduit

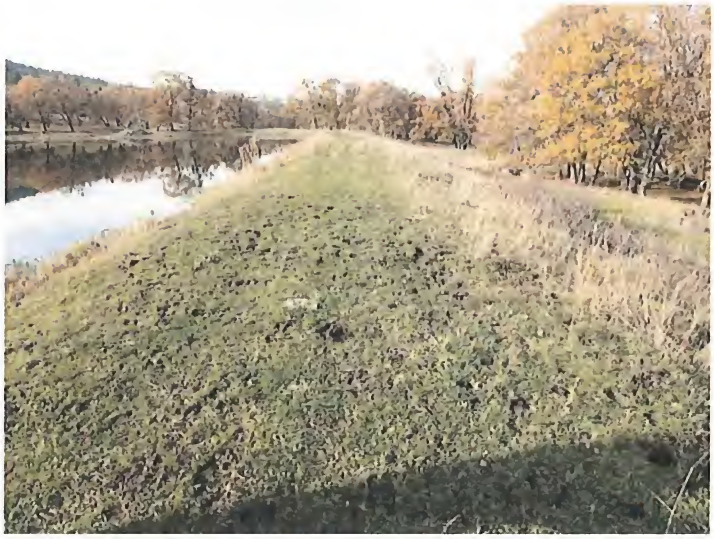
There is water leaking from the low level outlet conduit. It is not clear if the leak is from within the conduit or from around the exterior of the conduit. The visible section of the corrugated metal pipe outlet is highly corroded and should be addressed.



Main dam

The dam and auxiliary dam show signs of bovine activity. Cattle should be kept off these structures in order to preserve the integrity of the dam and its storage maximum capacity.

Bradshaw 2 (B-83)

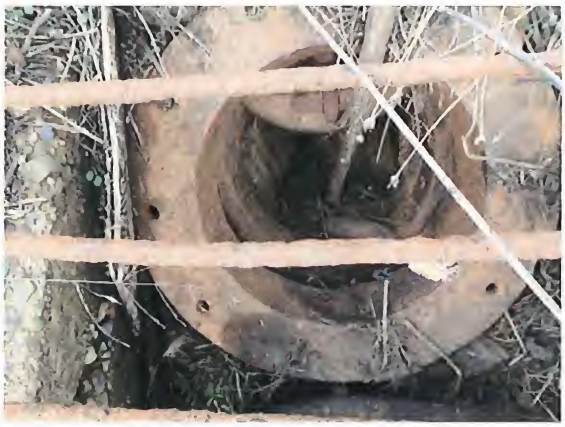


Cattle activity on the crest of the dam

There is abundant cattle activity along the crest and downslope of the dam. There is a clear pathway eroded on the downslope face that may promote erosion. Trampling of the crest can reduce freeboard and total storage of the reservoir. We recommended keeping cattle off the structure in the future in order to preserve its integrity in the long term. There are several small oak saplings along the down slope of the dam. These should be removed before they have the opportunity to compromise the structure.

Frog Pond (F-30)

Outlet of low level conduit

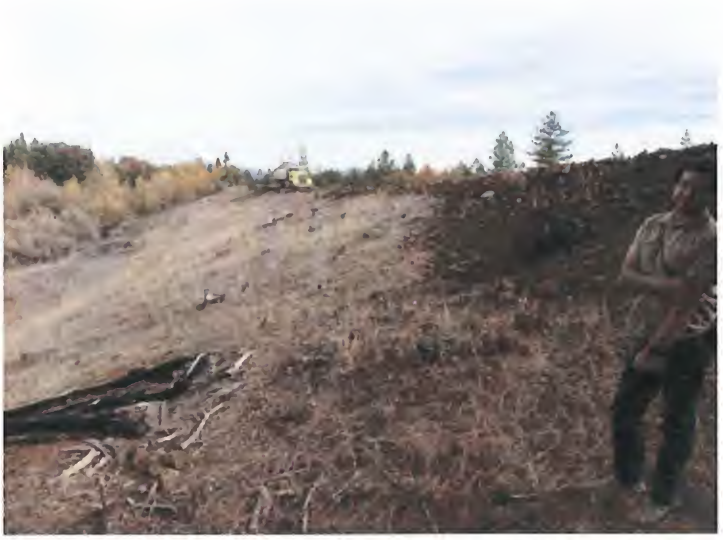


Inlet to low level conduit

The inlets and outlet and control structure for the low level conduit are deteriorated with unclear functionality. We suggest cycling the outlet at least once per year to ensure the ability to release water in the event of an emergency.

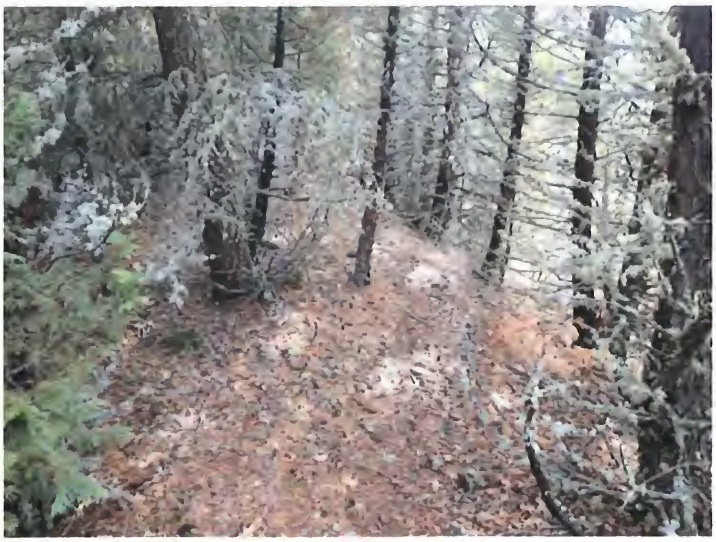
The down slope, right abutment, toe, and the auxiliary dikes are all overgrown with woody vegetation. This should be remedied in order to avoid/mitigate damage to the integrity of the structures. This reservoir appears to not currently be in use. Please contact us if you intend to resume storage. It is recommended that regular maintenance is continued on this structure in the interim.

Harrison (H-36)



Road maintenance on the crest of the dam

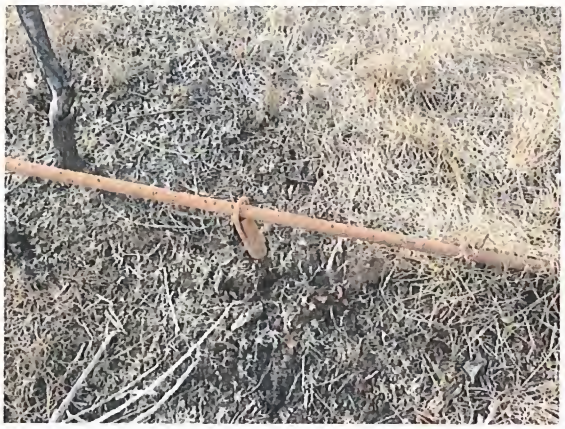
This reservoir appears to not currently be in use. Please contact us if you put this dam back into service. We recommended that you continue regular on this structure in the interim.

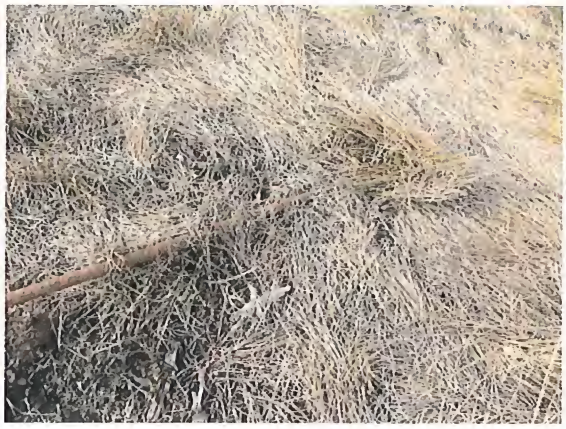


Numerous trees on auxiliary dam

While we were on site there appeared to be road improvement occurring along the crest of the dam. Any heavy equipment used may have lowered the crest and consequently the

available freeboard. Additionally, there was abundant vegetation growing along the left abutment, left auxiliary dike, and potentially within the channel of the spillway.





The control structures and outlet are corroded and partially buried. This may need to be addressed prior to resuming use of this reservoir. It is prudent the outlet be fully functional, as it is the only way to release water from the reservoir in the event of an emergency.

Progress Needed - High Hazard Dams

As we have discussed for a number of years, the conduits through these dams are deteriorated and are a serious safety concern. This safety concern continues to increase with each passing year and further deterioration of the conduit. The dam will not be safe until there are no conduits that can develop holes and cause internal erosion or slope instability. Internal erosion and slope instability are the cause of many dam failures, and a landslide in 1961 almost caused failure of Woodrat Knob dam.

It may be acceptable to install new pipes at locations other than the bottom of the dams. Under this alternative, grouting of the old pipes would be necessary. Pipes at alternative locations may require less excavation and may allow for a more efficient irrigation system. These pipes would need to be located so that they allow use of the water and so they can lower the reservoir in an emergency. An engineer, or a small team of engineers, may be able to design an efficient solution that improves your ability to use water, and one that also could lower any dam quickly and effectively in an emergency.

As with the spillway at Woodrat Knob dam, it is essential that you bring these dams into fully safe and operational condition. At this point, there is still time to avoid action under ORS 537.350 through 537.390; however, a timeframe developed by an engineer is necessary. The choice of engineer is yours. Please call us if you would like help formulating potential questions for the engineer with regard to meeting the needs of your operation as well as the needs of dam safety.

Specific Recommendations

1. Address the conduits on all three high hazard dams, so that all can safely lower water levels and provide continuous service as essential for these dams. Please consult an engineer for this work. It may not be essential to replace the conduits in same location. The conduits must be able to lower the reservoir significantly, but not necessarily to the bottom level. Work with an engineer who is knowledgeable about irrigation and dams. They may be able to consider this work for the other dams as well as make your entire irrigation system more efficient.

2. Install new toe drains on Woodrat Knob Dam.

3. If existing pipe locations not used, grout the old pipes.

4. Let us know if we need to make any changes to this working copy of an emergency action plan for the three high hazard dams.

5. Continue overall very good control of vegetation and animals on the dams.

We use a standard inspection form, and a copy of the field inspection sheet for this dam is attached. We plan on another routine inspection of the three high hazard dams next year. Please let us know if you have any questions about this inspection.

I would be happy to discuss the necessary work, and consultants who might be able to work together to develop an action plan to make the dams as safe and useful as is practicable.

Sincerely,

Keith Mills, P.E., State Engineer
(503) 986-0840
Cell (541) 706-0849

C: Travis Kelly, Watermaster District 13
Dam Safety Files **(W-43) (L-24) (O-15)** (B-24, B-83) (F-30) (H-47)

Attachment: Working Draft Emergency Action Plan

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Woodrat File #: W-43
Height: 90 ft. Storage: 1789 ac. ft. Permit: _____ NID #: OR- 00354
Hazard: ☐ Low ☐ Significant ☑ High ☐ **Request Inundation Analysis for change**
Inspector(s): Keith Mills, Lyndsey Croghan Watermaster District: 13
Others on site: Trevor Smith, Travis Kelly
Date: 6/17/2016 Weather: clear, hot
Prior Inspection Date: 4/22/2015 Issues from prior inspection: outlet pipe. toe drains
Expedited Re-inspection Needed: ☐ Next Inspection Date: 2017

Rating Criteria: *5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly***

I. Dam	☑ Earth ☐ Rock ☐ Concrete ☐ Other	Rating
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent grass cover	4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching grass cover	4
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression, Slide grass cover	4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) clear, dry	4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) Clear, dry	4
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil clear, seepage on berm toe drain	3
Seepage/leak flow	Right ____ gpm Center ____ gpm Left ____ gpm Other ____ gpm (use comment)	
Auxiliary dike (s)	☑ No ☐ Yes ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	—
Comments:	Seepage on top of berm; just wet spot below dam	

II. Reservoir	Pool elevation: -9.5	Point of Reference: crest	Rating
Minimum freeboard	Vertical distance debris from debris line to crest 6.3 ft.		4
Floating Debris/Trash	☑ Clean ☐ Around reservoir ☐ Near spillway		4
Log Boom	☑ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective		—
Unusual Conditions	☑ None ☐ Active Landslide ☐ Wildfire in Watershed ☐ Other (comments)		—
Comments:	Current water level 9.5' below crest		

III. Toe Drains #									
Flow (gpm)	3								
Damage	buried								
Sediment	clear								
Rating	2-								

IV. Conduit	Control: ☒ Manual ☐ Power ☐ Other ☐ Conduit Control missing	Rating
Inlet	☒ Submerged ☐ Debris on Trash Rack ☐ Deterioration	—
Trickle tube	☒ None ☐ Screened ☐ Blockage ☐ Deterioration	—
Control/Stem	☒ Operable ☐ Damaged ☐ Missing used to fill canal	3
Valve(s) cycling	☐ Frozen ☐ unknown ☐ past year ☒ frequent	4
Size:	Material corrugated | Condition well rusted, flowing full	2
Outlet Structure	☐ Overgrown ☐ Clean ☐ Pressurized ☐ Leaking _____ gpm	—
Secondary outlet	☐ Yes ☒ No Type _____ Diameter _____ in.	—
Comments:	needs replacing, somewhat difficult to access	

V. Spillway	☒ Earth ☒ Rock ☐ Concrete ☐ Other	Rating
Modifications	☒ None ☐ Reduction in capacity ☐ Feature not on design	—
Approach Channel	☒ Clear ☐ Trees/brush ☐ debris ☐ erosion	5
Control Section	Width ___ Depth ___ ☐ Concrete ☒ Rock ☒ Soil ☐ Culvert ☐ Unstable	5
Flashboards/Gate	☒ None ☐ In place ☐ operational ☐ deteriorated	—
Discharge Channel	☒ Clear ☐ Trees/brush ☐ leakage ☐ headcutting (___ feet approaching control section, depth ___ feet.)	5
Stilling basin	☒ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	—
Aux. Spillway	☐ Yes ☒ No (use comments below)	—
Comments:	as-builts on file, PMF calculations remarkably improved	

VI. Access and Security		Rating
Vehicle access	☐ Public road ☐ all weather road ☒ dirt road ☐ cross country	5
Fencing, signage	☐ Remote ☒ Gate ☒ Secure Fence ☐ Camera ☐ Uncontrolled	5
New Structure below dam	Dwelling ___ feet Paved public road ___ feet Other sig building ___ feet	—
Emergency Action Plan	☐ Not required ☐ Completed _____ at dam (dated_____) ☐ None	3
Comments:	EAP under development	

Instrumentation data reviewed: ☐ N/A ☐ Yes ☐ No

Other:

recommend digging out and replacing toe lines conduit

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Lake Creek File #: L-24
Height: 77 ft. Storage: 1360 ac. ft. Permit: _____ NID #: OR- 00395
Hazard: ☐ Low ☐ Significant ☒ High ☐ **Request Inundation Analysis for change**
Inspector(s): Keith Mills, Lyndsey Croghan Watermaster District: 13
Others on site: Travis Kelly, Trevor Smith
Date: 6/7/15 Weather: clear, hot
Prior Inspection Date: 4/22/15 Issues from prior inspection: outlet pipe, outlet structure, unknown spillway capacity
Expedited Re-inspection Needed: ☐ Next Inspection Date: 2017

***Rating Criteria:** 5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly***

I. Dam	☒ Earth ☐ Rock ☐ Concrete ☐ Other	Rating
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent grass cover, some wave erosion at high water level	4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching 14', grass cover	4
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression, Slide grass cover, some brush	4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) grass cover, little to no seepage	4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) grass cover	4
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil seepage, mud, no flow	3
Seepage/leak flow	Right ____ gpm Center ____ gpm Left ____ gpm Other ____ gpm (use comment)	
Auxiliary dike (s)	☒ No ☐ Yes ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	–
Comments:	downstream gage at Lake Creek	

II. Reservoir	Pool elevation: -9.2 Point of Reference: dam crest	Rating
Minimum freeboard	Vertical distance debris from debris line to crest 4.2 ft.	4
Floating Debris/Trash	☒ Clean ☐ Around reservoir ☐ Near spillway	4
Log Boom	☒ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective	–
Unusual Conditions	☒ None ☐ Active Landslide ☐ Wildfire in Watershed ☐ Other (comments)	–
Comments:		

III. Toe Drains #									
Flow (gpm)									
Damage									
Sediment									
Rating									

IV. Conduit	Control: ☒ Manual ☐ Power ☐ Other ☐ Conduit Control missing	Rating
Inlet	☒ Submerged ☐ Debris on Trash Rack ☐ Deterioration	—
Trickle tube	☒ None ☐ Screened ☐ Blockage ☐ Deterioration	—
Control/Stem	☒ Operable ☐ Damaged ☐ Missing	4
Valve(s) cycling	☐ Frozen ☐ unknown ☐ past year ☒ frequent	4
Size:	Material corrugated Condition poor, rusted	2
Outlet Structure	☒ Overgrown ☐ Clean ☐ Pressurized ☐ Leaking _____ gpm	2
Secondary outlet	☐ Yes ☒ No Type _____ Diameter _____ in.	—
Comments:	Leakage from holes in conduit	

V. Spillway	☒ Earth ☐ Rock ☐ Concrete ☐ Other	Rating
Modifications	☒ None ☐ Reduction in capacity ☐ Feature not on design	—
Approach Channel	☐ Clear ☐ Trees/brush ☒ debris ☐ erosion	4-
Control Section	Width 100' Depth ___ ☒ Concrete ☐ Rock ☐ Soil ☐ Culvert ☐ Unstable	4-
Flashboards/Gate	☒ None ☐ In place ☐ operational ☐ deteriorated	—
Discharge Channel	☐ Clear ☒ Trees/brush ☐ leakage ☐ headcutting (____ feet approaching control section, depth ____ feet.)	4
Stilling basin	☒ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	—
Aux. Spillway	☐ Yes ☒ No (use comments below)	—
Comments:	5.3' vert control section to crest. water level 3.9' below control section. need analysis	

VI. Access and Security		Rating
Vehicle access	☐ Public road ☐ all weather road ☒ dirt road ☐ cross country	5
Fencing, signage	☐ Remote ☒ Gate ☒ Secure Fence ☐ Camera ☐ Uncontrolled	5
New Structure below dam	Dwelling ___ feet Paved public road ____ feet Other sig building ____ feet	—
Emergency Action Plan	☐ Not required ☐ Completed _____ at dam (dated _____) ☐ None	3
Comments:	EAP in development	

Instrumentation data reviewed: ☐ N/A ☐ Yes ☐ No

Other:

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Osborne File #: 0-15
Height: 60 ft. Storage: 775 ac. ft. Permit: . NID #: OR- 00401
Hazard: ☐ Low ☐ Significant ☒ High ☐ **Request Inundation Analysis for change**
Inspector(s): Keith Mills, Lyndsey Croghan Watermaster District: 13
Others on site: Travis Kelly, Trevor Smith
Date: 6/7/16 Weather: Clear, hot
Prior Inspection Date: 4/22/15 Issues from prior inspection: outlet pipe valve operation
Expedited Re-inspection Needed: ☐ Next Inspection Date: 2017

***Rating Criteria**: 5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly***

I. Dam	☒ Earth ☐ Rock ☐ Concrete ☐ Other	Rating
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent grass cover, light wave erosion	4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching 14', grass cover	4
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression, Slide moderate cattle trampling	4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) generally dry	4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) some seepage	3
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil grass cover, poison oak	3
Seepage/leak flow	Right ____ gpm Center ____ gpm Left ____ gpm Other ____ gpm (use comment)	
Auxiliary dike (s)	☒ No ☐ Yes ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	–
Comments:		

II. Reservoir	Pool elevation: ~10.2	Point of Reference: crest	Rating
Minimum freeboard	Vertical distance debris from debris line to crest _____ ft.		4
Floating Debris/Trash	☒ Clean ☐ Around reservoir ☐ Near spillway		4
Log Boom	☒ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective		–
Unusual Conditions	☒ None ☐ Active Landslide ☐ Wildfire in Watershed ☐ Other (comments)		–
Comments:	Res level 5.2' below crest spillway 10.2 below crest dam		

III. Toe Drains #									
Flow (gpm)									
Damage									
Sediment									
Rating									

IV. Conduit	Control: ☒ Manual ☐ Power ☐ Other ☐ Conduit Control missing	Rating
Inlet	☒ Submerged ☐ Debris on Trash Rack ☐ Deterioration	—
Trickle tube	☒ None ☐ Screened ☐ Blockage ☐ Deterioration	—
Control/Stem	☒ Operable ☐ Damaged ☐ Missing	4
Valve(s) cycling	☐ Frozen ☐ unknown ☒ past year ☐ frequent rusted	4
Size:	Material corrugated | Condition rusted, functional	3-
Outlet Structure	☐ Overgrown ☐ Clean ☐ Pressurized ☒ Leaking < 0.25 gpm	3-
Secondary outlet	☐ Yes ☒ No Type _____ Diameter _____ in.	—
Comments:	Some seepage at outlet, difficult to locate outlet pipe. rusted, but functional	

V. Spillway	☒ Earth ☐ Rock ☐ Concrete ☐ Other	Rating
Modifications	☒ None ☐ Reduction in capacity ☐ Feature not on design	—
Approach Channel	☒ Clear ☐ Trees/brush ☐ debris ☐ erosion	4
Control Section	Width 80' Depth ____ ☐ Concrete ☒ Rock ☒ Soil ☐ Culvert ☐ Unstable	4
Flashboards/Gate	☒ None ☐ In place ☐ operational ☐ deteriorated	—
Discharge Channel	☒ Clear ☐ Trees/brush ☐ leakage ☐ headcutting (____ feet approaching control section, depth ____ feet.)	4
Stilling basin	☒ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	—
Aux. Spillway	☐ Yes ☒ No (use comments below)	—
Comments:		

VI. Access and Security		Rating
Vehicle access	☐ Public road ☐ all weather road ☒ dirt road ☐ cross country	5
Fencing, signage	☐ Remote ☒ Gate ☐ Secure Fence ☐ Camera ☐ Uncontrolled	5
New Structure below dam	Dwelling ___ feet Paved public road ____ feet Other sig building ____ feet	—
Emergency Action Plan	☐ Not required ☐ Completed _____ at dam (dated_____) ☐ None	3
Comments:	EAP in development	

Instrumentation data reviewed: ☐ N/A ☐ Yes ☐ No

Other:

Conduits are badly deteriorated

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Frog Pond #1

File #: H-30

Height: 20.00 ft. Storage: 60.00 ac. ft. Permit: R4950 NID #: OR- 00459

Hazard: ☐ Low ☑ Significant ☐ High ☐ **Request Inundation Analysis for change**

Inspector(s): SLH Watermaster District: 13

Date: 11/03/2016 Weather: Overcast

Prior Inspection Date: 08/02/2013 Issues from prior inspection: Vegetation and animal activity.

Expedited Re-inspection Needed: ☐ Next Inspection Date

***Rating Criteria**: 5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly***

I. Dam	☑ **Earth** ☐ **Rock** ☐ **Concrete** ☐ **Other**	**Rating**
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent	-4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching Low spot right of valve.	-4
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression Slide Vegetation	-4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) Vegetation	-4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy)	-4
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil Vegetation	-4
Seepage/leak flow	Right gpm Center gpm Left gpm Other gpm (use comment)	---
Auxiliary dike (s)	☐ No ☐ Yes ☐ 1 ☑ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	-4
Comments:	Dike #1 overgrow w/animal activity. Dike #2 overgrow w/ low spot.	

II. Reservoir	**Pool elevation**:	**Point of Reference**:	**Rating**
Minimum freeboard	Vertical distance debris from debris line to crest ft.		---
Floating Debris/Trash	☐ Clean ☐ Around reservoir ☐ Near spillway		---
Landslides/Erosion	☐ No activity ☐ Gully ☐ Inactive slide ☐ Active movement ☐ Stabilized		---
Log Boom	☐ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective		---
Comments:	Not in use.		

III. Toe Drains #	N/A								
Flow (gpm)									
Damage									
Sediment									
Rating	---								

IIIA. Other Instrumentation	☐ Piezometers	☐ Inclinometer(s)	☐ Ground Motion

Reviewed by dam safety engineer: ☑ NA ☐ Yes ☐ No

IV. Conduit	Control: ☐ Trickle tube ☑ Manual Valve ☐ Power Valve ☐ other	**Rating**
Inlet gate	☐ Submerged Functionality unknown	---
Trash Rack	☐ Submerged	4
Control/Stem	☑ Clean ☐ Greased ☐ Irregular	-4
Valve(s) cycling	☐ Frozen ☑ unknown ☐ past year ☐ frequent	-4
Diameter: 8'	Material CMP / Condition Oxidized with visible holes in both ends.	3
Outlet Structure	☐ Overgrown ☐ Clean ☐ Pressurized ☐ Leaking gpm	3
Secondary outlet	☐ Yes ☑ No Type Diameter in.	---
Comments:		

V. Spillway	☐ **Earth** ☐ **Rock** ☐ **Concrete** ☐ **Other**	**Rating**
Modifications	☐ None ☐ Reduction in capacity ☐ Feature not on design	
Approach Channel	☐ Clear ☐ Trees/brush ☐ debris ☐ sill	
Flashboards/Gate	☐ None ☐ In place ☐ operational ☐ deteriorated	
Discharge Channel	☐ Clear ☐ Trees/brush ☐ leakage ☐ headcutting (feet approaching control section, depth ft.)	
Stilling basin	☐ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	
Aux. Spillway	☐ Yes ☐ No (use comments below)	
Comments:	No defined spillway. Flow controlled into res. by a series of ditches.	

VI. Access and Security		**Rating**
Vehicle access	☐ Public road ☐ all weather road ☑ dirt road ☐ cross country	4
Fencing, signage	☐ Remote ☐ Clear signage ☐ Secure Fence ☐ Camera ☐ Unsecure	4
On Site Dam Tender/Contact	☐ Yes ☑ No Name: Phone:	4
Emergency Action Plan	☑ Not required ☐ Completed at dam (dated) ☐ None	4
Comments:		

Comments: High water mark just above outlet.
Consult us prior to resuming storage.

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Bradshaw

File #: B-24

Height: 47.00 ft. Storage: 785.00 ac. ft. Permit: R-4747 NID #: OR- 00442

Hazard: ☐ Low ☑ Significant ☐ High ☐ **Request Inundation Analysis for change**

Inspector(s): SLH Watermaster District: 13

Date: 11/03/2016 Weather: Overcast

Prior Inspection Date: 07/02/2013 Issues from prior inspection: Minor rodent activity, erosion, and vegetation.

Expedited Re-inspection Needed: ☐ Next Inspection Date

***Rating Criteria**: 5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2*-Serious repair needed; 1- *Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly

I. Dam	☑ **Earth** ☐ **Rock** ☐ **Concrete** ☐ **Other**	**Rating**
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent Animal tracks on aux dike, small tree.	Aux:-4, Dam:-4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching Minor vegetation obscuring inspection, low spot near outlet control.	Aux:-4, Dam:-4
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression Slide	4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy)	4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy)	4
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil	4
Seepage/leak flow	Right gpm Center gpm Left gpm Other gpm (use comment)	---
Auxiliary dike (s)	☐ No ☐ Yes ☑ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	4
Comments:	Do next inspection while full.	

II. Reservoir	**Pool elevation:** Near empty	**Point of Reference:**	**Rating**
Minimum freeboard	Vertical distance debris from debris line to crest 3.90 ft.		4
Floating Debris/Trash	☐ Clean ☐ Around reservoir ☐ Near spillway		4
Landslides/Erosion	☐ No activity ☐ Gully ☐ Inactive slide ☐ Active movement ☐ Stabilized		4
Log Boom	☐ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective		---
Comments:	4.3' freeboard on aux dike.		

III. Toe Drains #	N/A								
Flow (gpm)									
Damage									
Sediment									
Rating	---								

IIIA. Other Instrumentation	☐ Piezometers	☐ Inclinometer(s)	☐ Ground Motion

Reviewed by dam safety engineer: ☑ NA ☐ Yes ☐ No

IV. Conduit	Control: ☐ Trickle tube ☑ Manual Valve ☐ Power Valve ☐ other		Rating
Inlet gate	☑ Submerged		---
Trash Rack	☑ Submerged		---
Control/Stem	☐ Clean ☐ Greased ☐ Irregular Oxidized, has not been moved recently.		3
Valve(s) cycling	☐ Frozen ☑ unknown ☐ past year ☐ frequent		---
Diameter: 12	Material CMP	Condition CMP corroded @ outlet	3
Outlet Structure	☐ Overgrown ☐ Clean ☐ Pressurized ☑ Leaking gpm		3
Secondary outlet	☐ Yes ☑ No Type Diameter in.		---
Comments:	Outlet structure severely corroded, status of gate unknown.		

V. Spillway	☑ Earth ☐ Rock ☐ Concrete ☐ Other	Rating
Modifications	☑ None ☐ Reduction in capacity ☐ Feature not on design	---
Approach Channel	☑ Clear ☐ Trees/brush ☐ debris ☐ sill	4
Flashboards/Gate	☑ None ☐ In place ☐ operational ☐ deteriorated	---
Discharge Channel	☐ Clear ☑ Trees/brush ☐ leakage ☐ headcutting (feet approaching control section, depth ft.)	4
Stilling basin	☑ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	---
Aux. Spillway	☐ Yes ☐ No (use comments below)	---
Comments:	Small tree growing in channel.	

VI. Access and Security		Rating
Vehicle access	☐ Public road ☐ all weather road ☑ dirt road ☐ cross country	4
Fencing, signage	☑ Remote ☐ Clear signage ☑ Secure Fence ☐ Camera ☐ Unsecure	4
On Site Dam Tender/Contact	☐ Yes ☐ No Name: Phone:	4
Emergency Action Plan	☑ Not required ☐ Completed at dam (dated) ☐ None	4
Comments:		

Comments: Check inundation potential around Lake Creek.

Spillway dimensions:

Control: 58.8' @ top, 41' @ base

Channel: 45.8' @ top, 27.6' @ base

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Bradshaw #2

File #: B-83

Height: 20.00 ft. Storage: 60.00 ac. ft. Permit: R-4614 NID #: OR- 00429

Hazard: ☐ Low ☑ Significant ☐ High ☐ **Request Inundation Analysis for change**

Inspector(s): SLH Watermaster District: 13

Date: 11/03/2016 Weather: Sunny, cool

Prior Inspection Date: 07/02/2013 Issues from prior inspection: Vegitation and animal activity. Depression on crest.

Expedited Re-inspection Needed: ☐ Next Inspection Date

***Rating Criteria**: 5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly***

I. Dam	☑ **Earth** ☐ **Rock** ☐ **Concrete** ☐ **Other**	**Rating**
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent Cattle activity.	4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching Trampling. Cattle activity.	3
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression Slide Cattle activity, small oaks.	-4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) Cattle activity.	-4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) Cattle activity.	-4
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil Standing water beyond toe.	4
Seepage/leak flow	Right gpm Center gpm Left gpm Other gpm (use comment)	---
Auxiliary dike (s)	☑ No ☐ Yes ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	---
Comments:		

II. Reservoir	**Pool elevation**: Full	**Point of Reference**: Spilling	**Rating**
Minimum freeboard	Vertical distance debris from debris line to crest 2.50 ft.		4
Floating Debris/Trash	☑ Clean ☐ Around reservoir ☐ Near spillway		
Landslides/Erosion	☑ No activity ☐ Gully ☐ Inactive slide ☐ Active movement ☐ Stabilized		
Log Boom	☑ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective		
Comments:	Lowest spot right of valve.		

III. Toe Drains #	N/A								
Flow (gpm)									
Damage									
Sediment									
Rating	---								

IIIA. Other Instrumentation	☐ Piezometers	☐ Inclinometer(s)	☐ Ground Motion

Reviewed by dam safety engineer: ☑ NA ☐ Yes ☐ No

IV. Conduit	Control: ☐ Trickle tube ☑ Manual Valve ☐ Power Valve ☐ other	**Rating**
Inlet gate	☑ Submerged	---
Trash Rack	☑ Submerged	---
Control/Stem	☑ Clean ☐ Greased ☐ Irregular	4
Valve(s) cycling	☐ Frozen ☐ unknown ☐ past year ☑ frequent	4
Diameter: 5.5	Material concrete / Condition weathered, but appears sound.	4
Outlet Structure	☐ Overgrown ☑ Clean ☐ Pressurized ☑ Leaking gpm	-4
Secondary outlet	☐ Yes ☑ No Type Diameter in.	
Comments:		

V. Spillway	☐ **Earth** ☐ **Rock** ☑ **Concrete** ☐ **Other**	**Rating**
Modifications	☑ None ☐ Reduction in capacity ☐ Feature not on design	---
Approach Channel	☑ Clear ☐ Trees/brush ☐ debris ☐ sill	4
Flashboards/Gate	☐ None ☑ In place ☑ operational ☐ deteriorated	4
Discharge Channel	☑ Clear ☐ Trees/brush ☐ leakage ☐ headcutting (feet approaching control section, depth ft.)	4
Stilling basin	☑ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	---
Aux. Spillway	☐ Yes ☑ No (use comments below)	---
Comments:	Spillway 12' across, and 4.4' deep. Rectangular.	

VI. Access and Security		**Rating**
Vehicle access	☐ Public road ☐ all weather road ☑ dirt road ☐ cross country	4
Fencing, signage	☑ Remote ☐ Clear signage ☑ Secure Fence ☐ Camera ☐ Unsecure	4
On Site Dam Tender/Contact	☐ Yes ☑ No Name: Phone:	4
Emergency Action Plan	☑ Not required ☐ Completed at dam (dated) ☐ None	4
Comments:	Ranch manager is local.	

Comments:

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Harrison

File #: H-47

Height: 26.00 ft. Storage: 500.00 ac. ft. Permit: R-4951 NID #: OR- 00460

Hazard: ☐ Low ☑ Significant ☐ High ☐ **Request Inundation Analysis for change**

Inspector(s): SLH Watermaster District: 13

Date: 11/03/2016 Weather: Overcast

Prior Inspection Date: 07/02/2013 Issues from prior inspection: Vegetation, depression on crest, erosion on d. slope.

Expedited Re-inspection Needed: ☐ Next Inspection Date

***Rating Criteria**: 5-Very good; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact dam owner and dam safety engineer directly***

I. Dam	☑ **Earth** ☐ **Rock** ☐ **Concrete** ☐ **Other**	**Rating**
Up. Slope	Vegetation, Animals, Erosion, Wave Action, Depression, Whirlpool adjacent Vegetation	-4
Crest	Width, Surfacing, Vegetation, Trampling, Depression, Cracks, Breaching Road improvement along crest may have lowerered the crest.	-4
Down. Slope	Vegetation, Animals, Erosion, Seepage, Leak (muddy), Bulge, Depression Slide Trees on slope.	-4
R. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) Vegetation	-4
L. Abutment	Vegetation, Animals, Erosion, Seepage, Leak (muddy) Vegetation	-4
Toe	Vegetation, Erosion, Seepage, Leak (muddy), Boil Vegetation	-4
Seepage/leak flow	Right gpm Center gpm Left gpm Other gpm (use comment)	---
Auxiliary dike (s)	☐ No ☐ Yes ☑ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	-4
Comments:	Dike left of control heavily wooded	

II. Reservoir	**Pool elevation:**	**Point of Reference:**	**Rating**
Minimum freeboard	Vertical distance debris from debris line to crest ft.		---
Floating Debris/Trash	☐ Clean ☐ Around reservoir ☐ Near spillway		---
Landslides/Erosion	☐ No activity ☐ Gully ☐ Inactive slide ☐ Active movement ☐ Stabilized		---
Log Boom	☐ Not needed ☐ Present ☐ Needed ☐ Deterioration ☐ Ineffective		---
Comments:			

III. Toe Drains #									
Flow (gpm)									
Damage									
Sediment									
Rating									

IIIA. Other Instrumentation	☐ Piezometers	☐ Inclinometer(s)	☐ Ground Motion

Reviewed by dam safety engineer: ☑ NA ☐ Yes ☐ No

IV. Conduit	Control: ☐ Trickle tube ☑ Manual Valve ☐ Power Valve ☐ other	**Rating**
Inlet gate	☑ Submerged Closed.	---
Trash Rack	☑ Submerged	---
Control/Stem	☐ Clean ☐ Greased ☐ Irregular Rusted, uncased, and partially buried.	-4
Valve(s) cycling	☐ Frozen ☑ unknown ☐ past year ☐ frequent	-4
Diameter: 14	Material Cemt.Encased CMP | Condition Oxidized and partially buried.	4
Outlet Structure	☐ Overgrown ☑ Clean ☐ Pressurized ☐ Leaking gpm	4
Secondary outlet	☐ Yes ☑ No Type Diameter in.	
Comments:		

V. Spillway	☐ **Earth** ☐ **Rock** ☐ **Concrete** ☐ **Other**	**Rating**
Modifications	☐ None ☐ Reduction in capacity ☐ Feature not on design	
Approach Channel	☐ Clear ☐ Trees/brush ☐ debris ☐ sill	
Flashboards/Gate	☑ None ☐ In place ☐ operational ☐ deteriorated	
Discharge Channel	☐ Clear ☐ Trees/brush ☐ leakage ☐ headcutting (feet approaching control section, depth ft.)	
Stilling basin	☐ N/A ☐ Functional ☐ Minor Erosion ☐ Severe Erosion/Undercutting	
Aux. Spillway	☐ Yes ☐ No (use comments below)	
Comments:		

VI. Access and Security		**Rating**
Vehicle access	☐ Public road ☐ all weather road ☑ dirt road ☐ cross country	4
Fencing, signage	☑ Remote ☐ Clear signage ☐ Secure Fence ☐ Camera ☐ Unsecure	4
On Site Dam Tender/Contact	☐ Yes ☑ No Name: Phone:	4
Emergency Action Plan	☑ Not required ☐ Completed at dam (dated) ☐ None	4
Comments:		

Comments: Road work along crest may have lowered crest height. Be sure to contact us prior to resuming use of dam for further inspection.